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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,349	01/27/2006	Simha Levene	PHUS030259US	3486

38107 7590 01/19/2007

PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
595 MINER ROAD  
CLEVELAND, OH 44143

EXAMINER

KIKNADZE, IRAKLI

ART UNIT

PAPER NUMBER

2882

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/566,349

Applicant(s)

LEVENE ET AL.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16-18 and 21 is/are rejected.
- 7) ☒ Claim(s) 14, 15, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 1/27/2006.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 15 objected to because of the following informalities: Claim 15 depends on itself. Perhaps the recitation "The x-ray tube of claim 15", in line 1, should read --The x-ray tube of claim 14--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 10-13, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Silbermann (US Patent 2,942,126).

With respect to claim 1, Silbermann teaches an x-ray tube (see Figs.1-4) comprising: an envelope which defines an evacuated chamber; a source of electrons (2 and 3); an anode (1) mounted within the chamber for rotation about an axis (8) of rotation (column 3, lines 6-11), the anode (1) defining a sloped peripheral region on which a target area is defined, which target area is struck by electrons emitted by the electron source (2 and 3) and emits x-rays, the sloped peripheral region including a first annular portion (7), sloped at first angle relative to a plane perpendicular to the axis of rotation, and a second annular portion (6), adjacent the first portion, sloped at a second

angle, relative to the plane, the second angle being different from the first angle, the target area being defined partially on the first annular portion and partially on the second annular portion (column 3, lines 16-22). It should be noted that, alternatively, the first portion can be the track (6) and the second portion the track (7).

With respect to claim 2, Silbermann teaches that the first annular portion (7) is closer to a periphery of the anode (1) than the second portion (6) (see Fig.2).

With respect to claim 3, Silbermann teaches that the first angle and the second angle differ by at least  $1^{\circ}$  (column 3, lines 16-22).

With respect to claim 4, Silbermann teaches that the first and second angles differ by at least  $2^{\circ}$  (column 3, lines 16-22).

With respect to claim 10, Silbermann teaches an annular transition portion intermediate the first and second portions, the transition portion defining a smooth, curved transition between the first portion and the second portion (Fig.1)

With respect to claim 11, Silbermann teaches that the transition portion curves gradually from the first portion to the second portion; the transition portion sloped at the first angle adjacent the first portion and sloped at the second angle adjacent the second portion (Fig.1).

With respect to claim 12, Silbermann teaches that the second portion increases in slope with distance from the first portion (Fig.1).

With respect to claim 13, Silbermann teaches wherein the first angle is smaller than the second angle and the electron source is configured to deliver substantially the

same specific load to the portion of the target area on the first portion than to the portion of the target area on the second portion (column 3, line 40).

With respect to claim 16, Silbermann teaches the claimed x-ray tube as disclosed above in claim 1 rejection. The recitation "a computer tomography scanner" has not given patentable weight since it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

With respect to claim 18, Silbermann teaches a method for generating a beam of x-rays, comprising: accelerating and focusing a beam of electrons; and striking a target area on a sloping peripheral region an anode (1) that rotates about an axis of rotation (8) (column 3, lines 6-11), the peripheral region including a first annular portion (6) sloped at first angle relative to a plane perpendicular to the axis of rotation, and a second annular portion (7) radially spaced from the first annular portion (6) and sloped at a second angle relative to the plane, the second angle being different from the first angle, the target area being defined partially on the first annular portion and partially on the second annular portion ( Figs. 1-4; column 3, lines 18-26).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silbermann (US Patent 2,942,126) as applied to claim 1 above, and further in view of Amplatz (US Patent 4,355,409).

With respect to claim 5-7, Silbermann teaches claimed inspection except that the first angle is less than about 8°, about 6° to about 8° or about 7°. Amplatz teaches an x-ray tube (10) comprising a rotating anode (22) having a target surface (24) (see Fig.2) for generating the x-ray beams from most shallow portion of the target with a target angle 6.5° in order to reduce the optical density gradient (heel effect) which is normally presents in standard radiography (column 4, lines 58-68). It would have been obvious to one of ordinary skill in the art at time the invention was made to use rotating anode with the target angle in the range of 6.5° as suggested by Amplatz in the apparatus of Silbermann, since such a modification would provide user with the x-ray tube comprising the first angle (positioned closer to periphery of the anode) that is less than about 8°, about 6° to about 8° or about 7° to enhance the x-ray tube's performance due to reduction of the optical density gradient (heel effect).

With respect to claim 8, Silbermann teaches that the second angle is at least 8° (column 3, lines 16).

With respect to claim 9, Silbermann teaches the second angle is about 10° (column 6, line 7).

7. Claims 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silbermann (US Patent 2,942,126) as applied to claim 16 and 18

above, and further in view of Eisenberg et al. (US Patent Application Publication 2003/0129901 A1).

With respect to claims 17 and 21, Silbermann teaches claimed invention (column 4, lines 8-15) except a CT scanner including at least one x-ray detector and a reconstruction processor, the reconstruction processor being programmed to account for a higher x-ray flux from the first annular portion than from the second annular portion. Eisenberg teaches a CT scanner including at least one x-ray detector (26) and a reconstruction processor, the reconstruction processor being programmed to produce signal proportional to the input x-ray flux level and the energy of the x-ray flux. While the x-ray imaging, total x-ray photons are summed over all detectable photon energies in order to generate medical images (see paragraph 0088). It would have been obvious to one of ordinary skill in the art at time the invention was made to combine the CT scanner of Eisenberg with the x-ray tube of Silbermann, since such a modification would provide user with the improved CT scanner generating: high flux, the different angle beams, wide and/or narrow x-ray beams with image analysis and diagnosis capabilities.

***Allowable Subject Matter***

8. Claims 14, 15, 19 and 20 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 14 and 15, prior art fails to teach or make obvious an x-ray tube comprising a source of electrons includes a filament having a greater width in a region of the filament which emits electrons that strike the portion of a target area on a first annular portion and a smaller width in a region which emits electrons which strike the portion of the target area on the second annular portion as claimed including all of the remaining limitations of the base claim and any intervening claims.

With respect to claims 19 and 20, prior art fails to teach or make obvious a method for generating a beam of x-rays, comprising: generating electrons such that a portion of the election beam that strikes a target area on a first annular portion has a greater electron current density than a portion of the election beam that strikes the part of the target on the second annular portion as claimed including all of the remaining limitations of the base claim and any intervening claims.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamamura et al. (US Patent 4,287,420) and Seki (US Patent 3,610,984) teach an x-ray tube comprising two different size filaments for stereoscopic imaging. Oddell (US Patent 4,107,563) teaches a rotating anode x-ray tube.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00-5:30.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Irakli Kiknadze', with a stylized, cursive script.

Irakli Kiknadze  
Patent Examiner

ik/ January 5, 2007